

This listing of claims will replace all prior versions of claims in the application.

Claim 1. (currently amended) A photoresist comprising a photoactive component and a polymer that comprises: i) a heteroalicyclic group that does not contain a carbonyl ring member and is not an ~~oxonorbornyl-oxynorbornyl~~ and is fused to the polymer backbone and that contains one or more oxygen or sulfur ring atoms; ii) a carbon alicyclic group fused to the polymer backbone; and iii) a photoacid-labile moiety.

Claim 2. (original) The photoresist of claim 1 wherein the heteroalicyclic group has an oxygen ring member.

Claim 3. (original) The photoresist of claim 1 wherein the heteroalicyclic group has a sulfur ring member.

Claim 4. (previously presented) The photoresist of claim 1 wherein the carbon alicyclic group is a polymerized norbornene group.

Claim 5. (previously presented) The photoresist of claim 1 wherein the heteroalicyclic group has a non-hydrogen ring substituent.

Claims 6-7. (cancelled)

Claim 8. (previously presented) The photoresist of claim 1 wherein the polymer comprises a polymerized acrylate that comprises a photoacid-labile group.

Claims 9-22. (cancelled)

Claim 23. (previously presented) The photoresist of claim 1 wherein the polymer is a tetrapolymer or pentapolymer.

Claim 24. (previously presented) The photoresist of claim 1 wherein the polymer is completely free of aromatic groups.

Claims 25-34. (cancelled)

Claim 35. (previously presented) A method of forming a positive photoresist relief image, comprising:

- (a) applying a coating layer of a photoresist of claim 1 on a substrate; and
- (b) exposing and developing the photoresist image to yield a relief image.

Claims 36-40. (cancelled)

Claim 41. (previously presented) An article of manufacture comprising a microelectronic wafer substrate or a flat panel display substrate having coated thereon a layer of a photoresist composition of claim 1.

Claims 42-45. (cancelled)

Claim 46. (previously presented) The photoresist of claim 1 wherein the photoacid-labile moiety is a substituent of the heteroalicyclic group or carbon alicyclic group.

Claim 47. (previously presented) The photoresist of claim 1 wherein the photoacid-labile moiety is a polymer unit distinct from the heteroalicyclic group and carbon alicyclic group.

Claim 48. (previously presented) The photoresist of claim 1 wherein the polymer further comprises lactone or anhydride units.

Claim 49. (previously presented) The photoresist of claim 1 wherein the polymer further comprises polymerized maleic anhydride groups.

Claim 50. (previously presented) The photoresist of claim 1 wherein the heteroalicyclic group fused to the polymer backbone does not contain an unsaturated oxygen.

Claim 51. (previously presented) The photoresist of claim 1 wherein the heteroalicyclic group fused to the polymer backbone does not contain an unsaturated sulfur.

Claim 52. (currently amended) A photoresist comprising a photoactive component and a polymer that comprises: i) a heteroalicyclic group fused to the polymer backbone and that contains one or more oxygen ring members but does not contain an unsaturated oxygen and is not an oxonorbornyl-oxynorbornyl; ii) a carbon alicyclic group fused to the polymer backbone; and iii) a photoacid-labile moiety.

Claim 53. (previously presented) The photoresist of claim 52 wherein the carbon alicyclic group is a polymerized norbornene group.

Claim 54. (previously presented) The photoresist of claim 52 wherein the photoacid-labile moiety is a substituent of the heteroalicyclic group or carbon alicyclic group.

Claim 55. (previously presented) The photoresist of claim 52 wherein the photoacid-labile moiety is a polymer unit distinct from the heteroalicyclic group and carbon alicyclic group.

Claim 56. (previously presented) The photoresist of claim 52 wherein the polymer further comprises lactone or anhydride units.

Claim 57. (previously presented) The photoresist of claim 52 wherein the polymer further comprises polymerized maleic anhydride groups.

Claim 58. (previously presented) A method of forming a positive photoresist relief image, comprising:

- (a) applying a coating layer of a photoresist of claim 52 on a substrate; and
- (b) exposing and developing the photoresist image to yield a relief image.

Claim 59. (previously presented) The method of claim 58 wherein the photoresist layer is exposed with radiation having a wavelength of less than about 200 nm.

Claim 60. (previously presented) The method of claim 58 wherein the photoresist layer is exposed with radiation having a wavelength of about 193 nm.

Claim 61. (previously presented) The method of claim 35 wherein the photoresist layer is exposed with radiation having a wavelength of less than about 200 nm.

Claim 62. (previously presented) The method of claim 35 wherein the photoresist layer is exposed with radiation having a wavelength of about 193 nm.

Claim 63. (previously presented) An article of manufacture comprising a microelectronic wafer substrate having coated thereon a layer of the photoresist of claim 52.

Claim 64. (previously presented) The photoresist composition of claim 1 wherein the polymer is at least substantially free of aromatic groups.

Claim 65. (previously presented) The photoresist composition of claim 1
wherein the heteroalicyclic group that is not an anhydride or lactone.

Claim 66. (previously presented) The photoresist composition of claim 1
wherein the heteroalicyclic group contains a single ring oxygen atom.

Claim 67. (previously presented) The photoresist composition of claim 52
wherein the polymer is at least substantially free of aromatic groups.

Claim 68. (previously presented) The photoresist composition of claim 52
wherein the heteroalicyclic group contains a single ring oxygen atom.

Claim 69. (currently amended) A photoresist comprising a photoactive component
and a polymer that comprises: i) a heteroalicyclic group that is not an anhydride or lactone and is
fused to the polymer backbone and that contains one or more oxygen or sulfur ring atoms; ii) a
carbon alicyclic group fused to the polymer backbone; and iii) a photoacid-labile moiety.